Introduction of BEAMS (Business Efficiency Acceleration for Medical Data Review with Spotfire®) Project

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08 December 2022
Flow of This Session

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  - What is the BEAMS Project?
  - Data Review in Clinical Trials
  - Issues
  - How to Solve the Issues
  - Development to Go-Live

• How to implement
  - Target Study
  - Data Flow
  - Customization for each study in Spotfire®

• Sample report
• User feedback
• Future plans
Introduction

What is the BEAMS Project?

BEAMS = Business Efficiency Acceleration for Medical Data Review with Spotfire®

This is a project to support clinical science members in Chugai so that Medical Data Review can be performed efficiently and effectively using TIBCO®Spotfire®.
## Data Review in Clinical Trials

<table>
<thead>
<tr>
<th>Objective</th>
<th>Responsible Function</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Cleaning</td>
<td>• DM</td>
<td>• Site Monitoring</td>
</tr>
<tr>
<td></td>
<td>• CRA</td>
<td>• eCRF screen review</td>
</tr>
<tr>
<td></td>
<td>• Study Management</td>
<td>• Edit checks</td>
</tr>
<tr>
<td>Individual Subject Data Review</td>
<td>• CRA</td>
<td>• eCRF screen review</td>
</tr>
<tr>
<td>- Safety</td>
<td>• Study Management</td>
<td>• Data review materials</td>
</tr>
<tr>
<td>- PD</td>
<td>• Clinical Science</td>
<td>(including Spotfire® Webplayer)</td>
</tr>
<tr>
<td>- Efficacy</td>
<td>• Safety</td>
<td></td>
</tr>
<tr>
<td>Aggregate Data Review</td>
<td>• Clinical Science</td>
<td>• eCRF screen review</td>
</tr>
<tr>
<td>- Signal detection</td>
<td>• Safety</td>
<td>• Data review materials</td>
</tr>
<tr>
<td>(Safety, PD, and efficacy)</td>
<td></td>
<td>(including Spotfire® Webplayer)</td>
</tr>
<tr>
<td>- Specific Purpose</td>
<td></td>
<td>• Exploratory Assessment with Spotfire</td>
</tr>
<tr>
<td>(Cohort transition, etc.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Medical Data Review

Review of Key Data requiring medical interpretation for safety/efficacy assessment and signal detection

**Area requiring reinforcement**
There are several issues to be solved in Exploratory Assessment with Spotfire® in Chugai.

1. Insufficient materials for medical data review
2. Take time for preparing medical data review materials
3. Incomplete quality of medical data review materials
How to Solve the Issues

- Create Spotfire® template to prepare aggregate data review materials
- Maintain the template

- Save time for creating aggregate data review materials and customizing them for each study
- Increase reviewers by using the template
- Enable reviewers to perform aggregate data review appropriately and in a short period of time

Detect safety and efficacy signals early, achieve PoC confirmation early, and it leads to accelerate clinical development
Introduction

Development to Go-Live

- Decision of the template creation method ➔ Create template based on Roche template
- Preparation of development environment
- Customization of Roche templates for Chugai use + Addition of new forms
How to implement

Target Study

<table>
<thead>
<tr>
<th>Planned</th>
<th>CRO selection RFP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs for template use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What EDC used/ Laboratory Reference Ranges maintained in Rave or not</td>
</tr>
</tbody>
</table>

Study sponsored by Chugai

Necessary

Rave Not used

Rave Used

Laboratory reference ranges are maintained in Rave

Laboratory reference values are not maintained in Rave

Not Implementable

Implementable
How to implement Data Flow

Retrieve EDC data daily with Rave Web Service and load data to Teradata
How to implement

Customization for each study in Spotfire®

By embedding Python program, 70% to 80% of the construction work could be automated

- Data Mapping
- Rename Columns
- Set Column Width
- etc
BEAMS prepares forms for safety, test values, investigational drugs, etc.

* Regarding to Oncology, BEAMS prepares reports related to efficacy.
Sample report

Report : Subject Profile
Sample report

Report: AE Summary

1. AE System Organ Class Summary
   A subject that has reported AEs that are mapped to multiple SOC will be counted once in each SOC.

2. Overall AE Summary of Preferred Terms
   Note: Subjects that reported multiple AEs mapped to the same Preferred Term will be counted once within Preferred Terms.
   Note: % of subjects are based on subjects having received at least one dose of the study treatment.

2. AE Wide Listing
   [Table showing AE information with columns for AE ID, AE Type, AE Onset Study Day, AE Extreme Grade, Term Preferred, Onset Date, AE Resolution Date, Resolution Date, Outcome, Drug 1 Action Taken Due to AE, Drug 2 Action Taken Due to AE, AE Suspicion of AE with AEI]
Sample report

Report: Labs (Multiple Subject/Test)
Sample report

Report: AE >> Lab

2. Subject Selection

4 of 11 output marked on page AE >> Lab displayed:

1 marked. Next All.

3. Lab Results per Subject:

[Graph showing lab results with values and measurements]

3. Lab Listing

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Lab Test</th>
<th>Units</th>
<th>Value</th>
<th>Standard Value</th>
<th>Standard Units</th>
<th>WBC</th>
<th>Blood Alkaline Phosphatase</th>
</tr>
</thead>
<tbody>
<tr>
<td>12305</td>
<td>SGOT</td>
<td>IU/L</td>
<td>50</td>
<td>40</td>
<td>IU/L</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>12306</td>
<td>SGOT</td>
<td>IU/L</td>
<td>55</td>
<td>45</td>
<td>IU/L</td>
<td>2</td>
<td>45</td>
</tr>
</tbody>
</table>

4. Adverse Event Grade Change

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Event</th>
<th>Grade</th>
<th>Study Day of AE Change</th>
<th>Study Day of Grade Change</th>
<th>Cause Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>12305</td>
<td>COVID</td>
<td>1</td>
<td>21/01/2022</td>
<td>21/03/2022</td>
<td>Other Index</td>
</tr>
<tr>
<td>12306</td>
<td>Stroke</td>
<td>3</td>
<td>21/01/2022</td>
<td>21/04/2022</td>
<td>Blood Pressure</td>
</tr>
</tbody>
</table>

[Table showing adverse events with details]
Sample report

Report: Onc-Waterfall

### 1. Best Target SLQ % Change from Baseline (Waterfall Plot)

Mark a bar (or bars) to populate the 2. Subject list. Then mark a single subject on the 2. Subject list to populate the 3. Graphs below.

![Waterfall Plot Image](image)

### 3. ALL Lesions

For non-lesional cases within biopsied measurements, the minimum measurement is included in the SLQ.

For all other lesions with biopsied measurements, the maximum measurement is included in SLQ.

Only those with Subject Data Available (Code = ‘0’) are displayed.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Lesion Type</th>
<th>Lesion Location</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Target</th>
<th>SLQ</th>
<th>% Change from Baseline</th>
<th>% Change from 2nd Baseline</th>
<th>% Change from 3rd Baseline</th>
<th>% Change from 4th Baseline</th>
<th>% Change from 5th Baseline</th>
<th>Non-Target Lesions</th>
<th>Subject ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>11012</td>
<td>Target</td>
<td>0.5 X 0.5 cm</td>
<td>0.5</td>
<td>0.5</td>
<td>0.1</td>
<td>0.5</td>
<td>0.5</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td></td>
<td>092</td>
</tr>
<tr>
<td>11012</td>
<td>Target</td>
<td>0.5 X 0.5 cm</td>
<td>0.5</td>
<td>0.5</td>
<td>0.1</td>
<td>0.5</td>
<td>0.5</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td></td>
<td>092</td>
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<td>0.5</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td>-10%</td>
<td></td>
<td>092</td>
</tr>
</tbody>
</table>

**Legend:**
- Target: Lesion is targeted for treatment.
- Non-Target: Lesion is not targeted for treatment.
- SD: Standard Deviation
- % Change: Percentage change from baseline.
Sample report

Report: Onc-Spider Plot

1. Most Recent Resp and Best Resp

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Most Recent Resp</th>
<th>Most Recent Resp Day</th>
<th>Best Resp</th>
<th>Best Resp Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>11104</td>
<td>PD</td>
<td>26</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>11102</td>
<td>SD, Stable D</td>
<td>31</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>11103</td>
<td>SD, Stable D</td>
<td>22</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>11201</td>
<td>SD, Stable D</td>
<td>19</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>11202</td>
<td>SD, Stable D</td>
<td>20</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>11203</td>
<td>SD, Stable D</td>
<td>20</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>11204</td>
<td>SD, Stable D</td>
<td>26</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>11205</td>
<td>SD, Stable D</td>
<td>16</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>11206</td>
<td>SD, Stable D</td>
<td>64</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>11207</td>
<td>SD, Stable D</td>
<td>25</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

2. Target + New mSCLD % change from Baseline

- Select Y axis: Target + New mSCLD % change from Baseline
- Color by: Best Overall Response

1. ALL Lesions

For Lymph nodes with 2-dimensional measurements, the minimum measurement is included in the SCLD. For Lymph nodes with 3-dimensional measurements the maximum measurement is included in SCLD.

Only Rows with Subject Disease Assessment Code = "Yes" are displayed.

Select a subject from the list to view all lesions above here.
User feedback

Individual subject data review

• Although the number of subjects in the XXX study was not so large, it was easy to identify the data to be checked because the list clearly shows which subjects continued or discontinued the study (e.g., safety review). The larger the sample size, the more useful it is.

• Although the amount of data such as the date of administration of investigational product, AEs, concomitant drugs, and test values was large, they were summarized in a visually comprehensible manner, allowing for deep interpretation in each case. For example, there was a patient who developed liver function test abnormal approximately 300 days after the start of investigational product, and other test values, AEs, vitals, concomitant drugs, tumor assessments, test values in other patients, etc. at that time point could be easily confirmed and reviewed.
Aggregated data review

• AEs, lab values, and vitals are presented in aggregated graphs and tables from various perspectives (Example: Scatter plots, bar charts, box plots, Spaghetti, Hy's law, etc. by grade for lab values). In particular, XXX is a drug in which abnormal liver function values are markedly observed after administration of investigational product. When these graphs are put together, a signal of abnormal liver function values is clear, and everyone was able to recognize it again in the same manner. I felt that it was easy to notice new signals.

• The efficacy-related forms are not only a list of RECIST evaluation but also other forms such as Swimlane, Spider Plot, and Waterfall Plot, which are visually clear and easy to see, and therefore easy to confirm while comparing with safety data.
Future plans

Synchronize with Roche to update template
  • Share information with Roche contacts and obtain updated information on the Roche template

Use Roche CRF template
  • Currently, 25% of the requirements are from Chugai, and 75% are based on Roche’s CRF template.
  • By using the exact same CRF template as Roche, the development effort of the BEAMS Form will be greatly reduced.

-> It is expected that more than 90% of settings can be implemented in Python
INNOVATION BEYOND IMAGINATION